United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ventura Fish and Wildlife Office
2493 Portola Road, Suite B
Ventura, California 93003

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IN REPLY REFER TO:
81440-2008-1-0047

November 2, 2007

Jim Rains
Staff Environmental Scientist
Plant Health and Prevention Services
California Department of Food and Agriculture
1220 N Street, Room A-316
Sacramento, California 95814

Subject: Light Brown Apple Moth Spraying in Santa Cruz and Northern Monterey Counties, California

Dear Mr. Rains:

We have reviewed your letter dated October 1, 2007, regarding the California Department of Food and Agriculture's (CDFA) proposal to control and eradicate the light brown apple moth (LBAM) (*Epiphyas postvittana*) in Santa Cruz and northern Monterey Counties. The CDFA is acting as the designated Federal representative of the U.S. Department of Agriculture in this matter. In your letter, you request our concurrence that the proposed spraying is not likely to adversely affect the following listed plant and animal species:

Endangered

- Tidewater goby (*Eucyclogobius newberryi*)
- Brown pelican (*Pelecanus occidentalis*)
- Ohlone tiger beetle (*Cicindela ohlone*)
- Zayante band-winged grasshopper (*Trimerotropis infantilis*)
- Robust spineflower (*Chorizanthe robusta* var. *robusta*)
- Yadon's piperia (*Piperia yadonii*)

Threatened

- Southern sea otter (*Enhydra lutris nereis*)
- Western snowy plover (*Charadrius alexandrinus nivosus*)
- California red-legged frog (*Rana aurora draytonii*)
- California tiger salamander (*Ambystoma californiense*)
- Santa Cruz tarplant (*Holocarpha macradenia*)
- Monterey spineflower (*Chorizanthe pungens* var. *pungens*)

Your letter did not include four other listed species that occur in the proposed spray area and that may be affected: the threatened marbled murrelet (*Brachyramphus marmoratus marmoratus*), and endangered Mount Hermon June beetle (*Polyphylla barbata*), Ben Lomond

Wallflower (*Erysimum teretifolium*), and Ben Lomond spineflower (*Chorizanthe pungens* var. *hartwegiana*). We assume that CDFA would have made a similar not likely to adversely affect determination for these species, based upon the rationale used for those included in your letter.

Your letter mentions two anadromous fishes over which we have no jurisdiction. We assume you have also initiated informal consultation with the National Marine Fisheries Service for those species and we will not address them further in this letter.

The CDFA has detected a population of LBAM in the area of Santa Cruz and northern Monterey Counties. The LBAM is a non-native agricultural pest that could cause extensive damage to California's economically important fruit crop. To control or eradicate the LBAM, the CDFA is proposing to spray pheromones specific to LBAM to disrupt the mating cycle and reduce the species' reproduction. The spraying would cover approximately 60.2 square-miles along the central coast of California in the communities of Santa Cruz, Prunedale, and Salinas.

The proposed project could have two distinct types of effects: those related to the impacts of the pheromones to be used (i.e., toxicity and effect on non-target organisms), and those caused by the overflights. The use of the LBAM pheromone would be in conjunction with a Federal quarantine on the movement of fruit to reduce the chances of artificial dispersal of LBAM to other areas. Application of the LBAM pheromone would be by three methods: individual dispensers located in orchards where they would be most effective; ground-spraying of the microencapsulated form of the pheromone; or aerial spraying to cover larger areas. The individual dispensers are suspended above the ground at 250 dispensers per acre, and they are effective for approximately 90 days. Because of the size of the area needing to be sprayed (approximately 60,000 acres), most of the pheromone would be applied by aerial spraying. Any one area within the 60,00 acres is likely to receive at least two and probably several treatments over several years, until the LBAM is eradicated.

Two types of pheromones would be used. One is a leafroller pheromone that attracts members of the Family Tortricidae of which LBAM is a member. It is not specific to LBAM, so while native Tortricids may be affected by this pheromone, none in the spray area are listed as threatened or endangered. However, the general effect of the leafroller pheromone on native, non-target moths could have an indirect impact on their role as part of the pollinator community. Four of the listed plants in the project area (Ben Lomond wallflower, Ben Lomond spineflower, Monterey spineflower, and robust spineflower) may be pollinated by moths; however, all of these plants attract a diverse set of pollinators (i.e., they are pollination generalists), so they are not exclusively moth-pollinated. Because of this ability to be pollinated by a diverse group of insects, the decline of moths would be insignificant to the reproduction of these four plants. Yadon's piperia flowers are most fragrant at dusk and evening hours, so they are predominantly pollinated by moths. Moth species in the Families Pyralidae, Geometridae, Noctuidae, and Pterophoridae have been recorded at Yadon's piperia flowers. Because Yadon's piperia is reliant on moths as pollinators, we cannot rule out the potential for this species to also be pollinated by Tortricid moths.

The preferred pheromone is specific to LBAM and would not affect the reproduction of any other insects. The pheromone also has low toxicity to mammals, birds, fish, and invertebrates when used at the proposed concentrations. It will not be applied directly to water. The CDFA also notes that the pheromone is insoluble and would not dissolve in any water it contacts (large quantities (more than can be applied by the spraying) would have to be added to water before enough dissolved to reach levels toxic to aquatic organisms). The LBAM pheromone will degrade quickly in terrestrial and aquatic environments when exposed to ultraviolet radiation (light) and oxidation.

The Environmental Assessment provided by the CDFA includes an Ecological Risk Assessment that states that the acetate-based straight-chain lepidopteran pheromones (such as the LBAM pheromone) are practically non-toxic to mammals. They are also of very low toxicity to birds, even at concentrations higher than those that the CDFA would use in its LBAM spraying. This group of pheromones is also only toxic to aquatic species at high concentrations (higher than would be achieved during the proposed spraying, according to the CDFA). Although the LBAM pheromone itself has not been evaluated in this regard, the Ecological Risk Assessment concludes that the risks to non-target organisms for similar acetate-based straight-chain lepidopteran pheromones are well below any level of concern established by the EPA.

Because the LBAM pheromone breaks down quickly in the environment, it is not expected to accumulate in the spray area where it would affect listed species. Even after several years of spraying, the LBAM-specific pheromone and the general leaf-roller pheromones are not likely to affect any of the listed species because these chemicals are specific to these types of moths and are of very low toxicity to non-target organisms.

While toxicity of the pheromones is apparently not a concern for animals, the actual aerial spraying may pose a problem for some species. The overflight and turn areas take the spraying aircraft over areas known to support roosting brown pelicans, western snowy plovers, and marbled murrelets. One overflight, or a couple in short succession, may not be a problem; however, if the overflights are repeated several times in a short period, the repeated disruption of roosting may cause these species to abandon their roosts. Also, repeated flushing from a roost site may cause excessive energy demands, especially for a large bird like the brown pelican. Based upon information provided by the CDFA, the overflights would occur at night and at an elevation of at least 800 feet above ground level. Consequently, we do not anticipate that these species would be flushed from their roost sites.

We concur with your determination that the spraying of the LBAM and leaf-roller pheromones is not likely to adversely affect the following listed species:

Southern sea otter
Western snowy plover
Marbled murrelet
Brown pelican
California red-legged frog

California tiger salamander
Tidewater goby
Ohlone tiger beetle
Mount Hermon June beetle
Zayante band-winged grasshopper
Robust spineflower
Monterey spineflower
Ben Lomond spineflower
Santa Cruz tarplant
Ben Lomond wallflower

Our conclusion for these species is based upon: (1) the low toxicity of the pheromones (at the proposed concentrations) to mammals, birds, and aquatic organisms; (2) the specificity of the pheromones to LBAM and Tortricids (none of which are listed); (3) the application methods which include avoidance of open water, use of ground spraying when possible, and use of dispensers in target areas; (4) the biodegradable nature of the pheromones and the fact that the chemicals will not accumulate in the environment; (5) the LBAM pheromone is not water soluble so it would not reach concentrations where it would be toxic to aquatic organisms; (6) although the leaf-roller pheromone could affect native moths that could act as pollinators of the listed plants, most of the listed plant species in the area not likely to be adversely affected by the decline of this group of moths because they attract a diverse group of pollinating insects; and (7) the overflights would be conducted in such a manner that they should not cause roosting birds to flush to the point where energy expenditures are excessive.

We do not concur with your determination that the proposed spraying is not likely to adversely affect Yadon's piperia. Because the CDFA proposes to use a non-specific pheromone that could disrupt the reproduction of an entire Family of moths, and because moths are the principal pollinators of Yadon's piperia, we conclude that over several years of spraying, the loss of this portion of the pollinator community could have an adverse effect on the seed set of Yadon's piperia. To avoid adverse effects on Yadon's piperia, we recommend that the CDFA, with the Service's assistance, identify the locations of known populations of this plant and avoid spraying the leaf-roller pheromone within ¼-mile. The LBAM-specific pheromone can be sprayed anywhere in the area. If CDFA cannot implement these avoidance measures, formal consultation pursuant to section 7(a)(2) of the Endangered Species Act of 1973, as amended, is required.

For the species other than Yadon's piperia, further consultation, pursuant to section 7(a)(2) of the Act, is not required. If the proposed action changes in any manner that could result in adverse effects not anticipated, the CDFA should suspend all activities and contact us immediately until the appropriate level of consultation is completed.

If you have any questions regarding this matter, please contact Rick Farris of my staff at (805) 644-1766, extension 316.

Sincerely,

For David M. Pereksta
Assistant Field Supervisor

Table 1. Summary of Rationale for Concurrence with CDFA Determinations

SPECIES	STATUS	REASON(S) FOR CONCURRENCE[1]
Tidewater goby	Endangered	1, 3, 4, 5
Brown pelican	Endangered	1, 3, 4, 5
Ohlone tiger beetle	Endangered	1, 3, 4
Zayante band-winged grasshopper	Endangered	1, 3, 4
Robust spineflower	Endangered	2, 4, 6
Yadon's piperia	Endangered	NA
Southern sea otter	Threatened	1, 3, 4, 5
Western snowy plover	Threatened	1, 3, 4
California red-legged frog	Threatened	1, 3, 4, 5
California tiger salamander	Threatened	1, 3, 4, 5
Santa Cruz tarplant	Threatened	2, 4, 6
Monterey spineflower	Threatened	2, 4, 6

[1]Reasons for Concurrence:

1. Low toxicity of the pheromones (at the proposed concentrations) to mammals, birds